

What Is Claimed Is:

1. An air mass flow controller valve for fuel cells, the flow controller valve comprising:
- an inlet disposed along a first axis;
- at least two channels in communication with the inlet, the at least two channels disposed along a second axis;
- at least one air mass sensor disposed proximate one of the at least two channels;
- a seat portion disposed between one channel of the at least two channels;
- at least two closure members, one of the at least two closure members disposed proximate one channel of the at least two channels, the other of the at least two closure member disposed proximate the other channel of the at least two channels, each closure member movable to a plurality of positions, a first position permitting air flow between each channel to the inlet and a second position preventing communication between one channel of the at least two channels and the inlet; and
- at least two actuators coupled to a respective one of the at least two closure members, the at least two actuators responsive to one of the air mass sensors in each channel of the at least two channels to move a respective one of the at least two closure members between the first position and the second position.

2. The valve of claim 1, wherein the seat portion further comprises an annular seat having a third axis transverse to one of the first axis and second axis.

Sub A2 3. The valve of claim 1, wherein the inlet further comprises a portion having a first cross sectional area and a second cross sectional area proximate the at least two channels, the second cross sectional area being greater than the first cross-sectional area.

5 4. The valve of claim 1, wherein the at least one airmass sensor comprises a pressure sensor disposed in the inlet and a position sensor that senses the position of the actuator.

Sub B1 5. The valve of claim 2, wherein the closure member is disposed proximate the annular seat, the closure member operable to move along the third axis between the first position and second position.

Sub B3 6. The valve of claim 1, wherein each of the at least two channels further comprises an inlet portion disposed along the first axis and an outlet portion disposed along a fourth axis spaced from the first axis by a distance, the distance between the first axis and the fourth axis defining the seat portion.

Sub B1 7. The valve of claim 6, wherein the seat portion further comprises a seating surface in a confronting arrangement with the closure member, the seating surface having at least one seal disposed between the seating surface and the closure member.

8. The valve of claim 1, wherein each of the at least of the two actuators further comprises a sliding bearing, the sliding bearing configured to permit the closure member to reciprocate

between the first position and the second position.

Sub AH 9. The valve of claim 6, wherein the at least two actuators further comprise a housing for each actuator, the housing having a first wall and a second wall disposed along the third axis, a third wall disposed along the first axis and a fourth wall disposed along the fourth axis, the first and third walls formed as part of the inlet portion, the second and fourth walls formed as part of the
5 outlet portion.

Sub BI 10. The valve of claim 9, wherein the housing further comprises a sensor cap configured to couple with the first wall and second wall in a locking arrangement.

11. The valve of claim 10, wherein the sensor cap further comprises an electrical connector.

12. The valve of claim 9, wherein the first and third walls of each actuator are orthogonal to the first and third walls of the other actuator of the at least two actuators.

13. A method of distributing metered airflow from an inlet to a plurality of channels in a fuel cell, each channel of the plurality of channels provided with an air mass flow sensor that provides a signal indicating measured air amount flowing in each channel of the plurality of channels, a plurality of closure members, each closure member being contiguous to a seat
5 portion and disposed in a respective channel of the plurality of channels, each closure member

Sub 131 being movable by an actuator between a first position to permit flow and a second position to prevent flow, the method comprising:

flowing air to the inlet;

determining an air mass amount in each channel of the plurality of channels; and

10 metering the air mass amount provided to each channel from the inlet as a function of a desired air amount and the air mass amount determined in each channel.

Sub 131 14. The method of claim 13, wherein the flowing air further comprises flowing air in a passage with a first portion and a second portion, first portion having a first cross section area and the second portion with a second cross sectional area, the second cross sectional area being greater than the first cross sectional area.

Sub 131 15. The method of claim 13, wherein the determining of the air mass amount further comprises sensing a voltage of a transducer disposed in each channel of the plurality of channels.

16. The method of claim 13, wherein the metering further comprises modulating the closure member between the first position and the second position.

17. The method of claim 16, wherein the modulating further comprises reciprocating the closure member in response to pulsewidth modulated signals.

18. The method of claim 16, wherein the modulating further comprises feedback controlling the closure member between the first position and the second position based on a difference between the desired air amount and determined air amount.

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